



**Federal Aviation  
Administration**

DOT/FAA/AM-11/12  
Office of Aerospace Medicine  
Washington, DC 20591

# **Studies of Next Generation Air Traffic Control Specialists: Why Be an Air Traffic Controller?**

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August 2011

**Final Report**

OK-11-0024-JAH

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### Technical Report Documentation Page

1. Report No. DOT/FAA/AM-11/12		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Studies of Next Generation Air Traffic Control Specialists: Why Be an Air Traffic Controller?				5. Report Date August 2011	
				6. Performing Organization Code	
7. Author(s) Cannon MM, Broach D				8. Performing Organization Report No.	
9. Performing Organization Name and Address FAA Civil Aerospace Medical Institute P.O. Box 25082 Oklahoma City, OK 73125				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No.	
12. Sponsoring Agency name and Address Office of Aerospace Medicine Federal Aviation Administration 800 Independence Ave., S.W. Washington, DC 20591				13. Type of Report and Period Covered	
				14. Sponsoring Agency Code	
15. Supplemental Notes Work was accomplished under approved task AM-523					
16. Abstract <p>With phrases such as "Managing Millennials" (Gimbel, 2007), descriptions of generational differences are a staple in the human resources (HR) trade press and corporate training. The Federal Aviation Administration (FAA) offers a course in managing generational differences through its Center for Management Education and Leadership. Most management tips and descriptions of generational differences are anecdotal, prescriptive and impressionistic. Few empirical studies are available, and those that do exist are based on cross-sectional surveys, confounding the effects of age and career progression with generational differences. Yet the generational comparisons could be important to occupational recruitment; what appealed to one generation might not appeal to another. For example, the job security and stability that appealed to "Baby Boomers" might be less important to "Gen-X" and "Millennials," who are said to be looking to "make a difference" with some level of "work-family balance" (Partnership for Public Service, 2009, undated). The purpose of the current study was to compare the factors influencing occupational choice in two distinct generations of employees in the FAA's highly visible air traffic control specialist (ATCS) occupation. We hypothesized that factors such as job security, benefits, and pay would be less important to the "Next Generation" of controllers, recruited from Gen-X and Millennials, than to the "Post-Strike" generation (largely Baby Boomers) and non-material factors such as the opportunity to benefit others would be more important to the Next Generation of controllers. <b>Method.</b> The responses of controllers hired in Fiscal Year (FY) 2009 (n=955) were compared to those of controllers hired in FY1986 through FY1992 (n=13,227) following the 1981 Professional Air Traffic Controllers Organization (PATCO) strike. The two groups did not overlap in age or birth year. The new controllers in both generations took the Biographical Questionnaire (BQ) for research purposes while at the FAA Academy for initial occupational training. The BQ includes 14 items asking to what degree material factors such as pay and non-material factors such as the opportunity to benefit others were important to their choice of the controller occupation. The proportions favorably endorsing each factor were compared with a standard Z-test of proportions. The rank-order of the factors in each generation was also compared using Spearman's rho. <b>Results.</b> Contrary to our hypothesis, job security, benefits, and pay were more important to Next Generation than to Post-Strike controllers. However, the overall rank-order correlation of the factors by generation was high (Spearman's rho = .824, p &lt; .001), suggesting a shift in degree rather than one of kind between generations. <b>Discussion.</b> The young Next Generation controllers hired by the FAA did not conform to the public stereotype; job security, benefits, and pay were just as important to them, if not more, than to the previous generation. This might be an effect of economic insecurity engendered by the 2007-2010 financial crisis in the U.S. The similar rank-ordering of factors influencing occupational choice suggests more similarity between generations than might be expected on the basis of the HR trade press. Implications for agency recruitment are considered in closing.</p>					
17. Key Words Generational Differences, Recruitment, Baby Boomers, Gen-X, Millennials, Occupational Choice, Air Traffic Control Specialists, Salary, Benefits, Job Security			18. Distribution Statement Document is available to the public through the Defense Technical Information Center, Ft. Belvoir, VA 22060; and the National Technical Information Service, Springfield, VA 22161		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 12	
				22. Price	



## **ACKNOWLEDGMENT**

Research reported in this paper was conducted under the Air Traffic Program Directive/Level of Effort Agreement between the Human Factors Research and Engineering Group (AJP-61), FAA Headquarters, and the Aerospace Human Factors Research Division of the FAA Civil Aerospace Medical Institute.



## CONTENTS

METHOD . . . . .	2
SAMPLE . . . . .	2
INSTRUMENT . . . . .	2
ANALYSES . . . . .	3
RESULTS . . . . .	3
DISCUSSION . . . . .	3
REFERENCES . . . . .	7





# STUDIES OF NEXT GENERATION AIR TRAFFIC CONTROL SPECIALISTS: WHY BE AN AIR TRAFFIC CONTROLLER?

“Gen-X,” “Gen-Y,” “Baby Boomer,” “Millennial,” “The Greatest Generation”: Labels and descriptions of different generations abound in the popular press and the human resources management (HRM) trade press. Values, working styles, preferences, expectations, aspirations, and experience are assigned to each generation such that the label becomes a short-hand description. The descriptions of these “generations” vary considerably by source. In some cases, values, expectations, and preferences are associated with generations, based on anecdotes and opinions. In other cases, values, preferences, and expectations are associated with a given generation on the basis of empirical surveys and polls. But even empirical studies of “generations” are suspect for at least two reasons. First, while the labels seem definitive, the generations overlap. As shown in Table 1, various authors assign differing birth years, not to mention values, to different generations (e.g., Kimberly, 2008; Kupperschmidt, 2000; Lancaster & Stillman, 2002; Lyons, Duxbury, & Higgins, 2005; Mackey, Gardner & Forsyth, 2008; McGuigan, 2010, Smola & Sutton, 2002; Strauss & Howe, 1991; Zempke, Raines & Filipczack, 2000). Baby Boomers, for example, are identified as those born starting anywhere from 1940 to 1946 through 1960 to 1964. The same inconsistencies are found for birth years for other generations. Second, most generational studies are based on cross-sectional surveys and confound generational effects with factors such as age and career progression (McGuigan, 2010).

Regardless of potential generational differences in the workplace, younger people are making occupational choices and entering the workforce, and older people are leaving the workforce. For example, the Federal Aviation Administration (FAA, 2010) is currently hiring the next generation (Next Generation) of air traffic control specialists (ATCSs, or controllers). More than 7,000 new controllers have been hired since 2002 as older controllers retire. Due to some unique circumstances, it is possible to compare the values and preferences of two generations without the usual confounds of age and career progression.

Those unique circumstances arise from two factors: the 1981 strike by the Professional Air Traffic Controllers Organization (PATCO), and the statutory requirement for controllers to retire from the occupation at age 56. In early August 1981, a large majority of controllers went out on strike across the U.S. The striking controllers were given an ultimatum by President Reagan to return to work or be fired; 11,345 of about 16,000 ATCSs were summarily fired (National Transportation Safety Board, 1981). The FAA then began hiring and training replacements. The vast majority of the newly hired controllers were between the ages of 18 and 30, due to a maximum entry age of 30 for most applicants (see Broach, [1998], for an overview). This group of ATCSs is referred to as the “Post-Strike” generation of controllers. Hiring of ATCSs declined dramatically in the late 1990s through 2005. Many of the Post-Strike ATCSs are now reaching

**Table 1.** Work Values Attributed to Generations (by Generation)

Baby Boomers (1940-46 through 1960-64)	Generation X (1960-65 through 1975-82)	Millennials/Next Generation (1978-82 through 1994-2000)
<ul style="list-style-type: none"> <li>• Less desire for promotion</li> <li>• Work central to person's life</li> <li>• Greater organizational loyalty</li> <li>• Highly competitive</li> <li>• “Workaholics”</li> <li>• Pursuit of success and achievement</li> <li>• Job Security</li> <li>• Power</li> <li>• Career Progression</li> </ul>	<ul style="list-style-type: none"> <li>• Desire rapid promotion on basis of knowledge</li> <li>• Moral value of work...working hard makes one a better person</li> <li>• Independent</li> <li>• Less organizational loyalty, emphasis on autonomy</li> <li>• Lack of job security</li> <li>• Greater emphasis on balance of work and family</li> <li>• Emphasis on social work environments</li> </ul>	<ul style="list-style-type: none"> <li>• Highly achievement oriented</li> <li>• Work prioritized over personal lives</li> <li>• Materialistic</li> <li>• Value prestige and status</li> <li>• Meaningful work</li> <li>• Flexible work</li> <li>• Mentoring/Immediate Feedback</li> <li>• Willing to leave jobs at the drop of a hat</li> </ul>

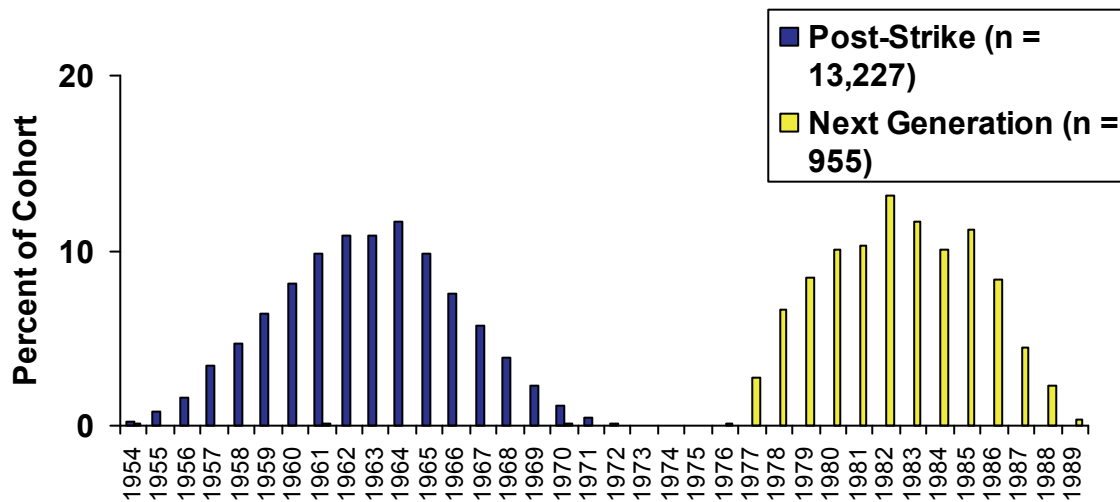


Figure 1: Birth Years of Post-Strike and Next Generation ATC Trainees

the mandatory retirement age of 56, so a massive hiring initiative of new replacement ATCSs is underway. Since 2005, the FAA has hired more than 7,000 new controllers and expects to hire around 1,000 per year through 2017 (FAA, 2010).

Like the Post-Strike ATCSs at the time of hire, the “Next Generation” of ATCSs being hired now are generally aged between 18 and 30 as the FAA has retained its policy setting the maximum age at entry to the controller occupation at age 30. Because relatively little hiring was done between the Post-Strike hiring years (generally 1981 to 1992) and the current hiring initiative beginning in 2005, the FAA ATCS workforce now has two clearly defined generational cohorts: the “Post-Strike” and “Next Generation” controllers. Research data collected from these two cohorts of ATCSs during their initial training provide a unique opportunity of looking at generational differences without the potential confounds of age and career progression.

This study compared the factors important to occupational choice for these two generational cohorts. The FAA has long collected biographical data from newly hired ATCS trainees for research purposes. Based on the HR trade literature and general press about generational differences, we hypothesized that factors such as job security, benefits, and pay would be less important to the “Next Generation” of controllers, recruited from Gen-X and Millennials, than to the “Post-Strike” generation (largely Baby Boomers). We also hypothesized non-material factors such as the opportunity to benefit others would be more important to the Next Generation controllers than it was to the Post-strike generation.

## METHOD

### Sample

The sample used for this study consisted of 13,227 Post-Strike and 955 Next Generation trainees during their initial training at the FAA Academy in Oklahoma City, OK. The Next Generation trainees are represented by those ATCSs who entered training in the year 2009. As shown in Figure 1, the sample consists of unique, virtually non-overlapping cohorts. The median birth years for the two cohorts are nearly 20 years apart (1963 vs. 1982). The average age at entry for the Post-Strike generation was 25.9 (SD = 2.96) and 26.7 (SD = 3.10) for the Next Generation controllers.<sup>7</sup>

### Instrument

The FAA Biographical Questionnaire (BQ) was administered to members of both cohorts as part of the FAA’s on-going research on the selection of controllers. The BQ consists of 195 items encompassing facets such as background, prior aviation experience, education, military service, life experiences, coping styles, and factors influencing the choice of occupation and employer. The BQ is administered to new hires during initial ATC training at the FAA Academy. This analysis focused on the factors influencing occupational choice, based on endorsements of items as having had considerable to very great importance in influencing their choice of the ATCS occupation.

**Table 2.** Results of Z-tests and Percent Indicating That the Factor was Of Considerable to Great Importance

Occupational Choice Factor	Post-Strike (N=13,227) %	Next Generation (N=955) %	Z
Job Security	74.8	95.5	-26.48***
Benefits	65.9	87.7	-18.90***
Intellectual Challenge	76.8	86.7	-8.39***
Importance of Job	70.6	86.6	-13.43***
Salary	72.0	82.0	-7.59***
Opportunity to Work with Competent People	63.4	80.7	-12.69***
Opportunity for Advancement	75.8	73.9	1.26
Opportunity to Benefit Others	47.9	72.2	-15.87***
Interest in Aviation	67.8	68.9	-2.17
Prestige of Job	52.8	63.8	-6.71***
Ability to Control Workload	31.4	54.1	-13.51***
Autonomy	37.4	38.3	-0.50
Prior Aviation Experience	31.2	31.7	-0.29
Opportunity to be Admired by Others	20.5	31.7	-7.16***

\*\*\*p < .0001

## Analyses

To assess inter-generational differences, the proportions of respondents in the two groups marking an occupational choice factor as having had considerable or very great influence were compared with Z-tests for independent proportions (Kanji, 1999). The factors were also rank-ordered, and Spearman's rho was computed.

## RESULTS

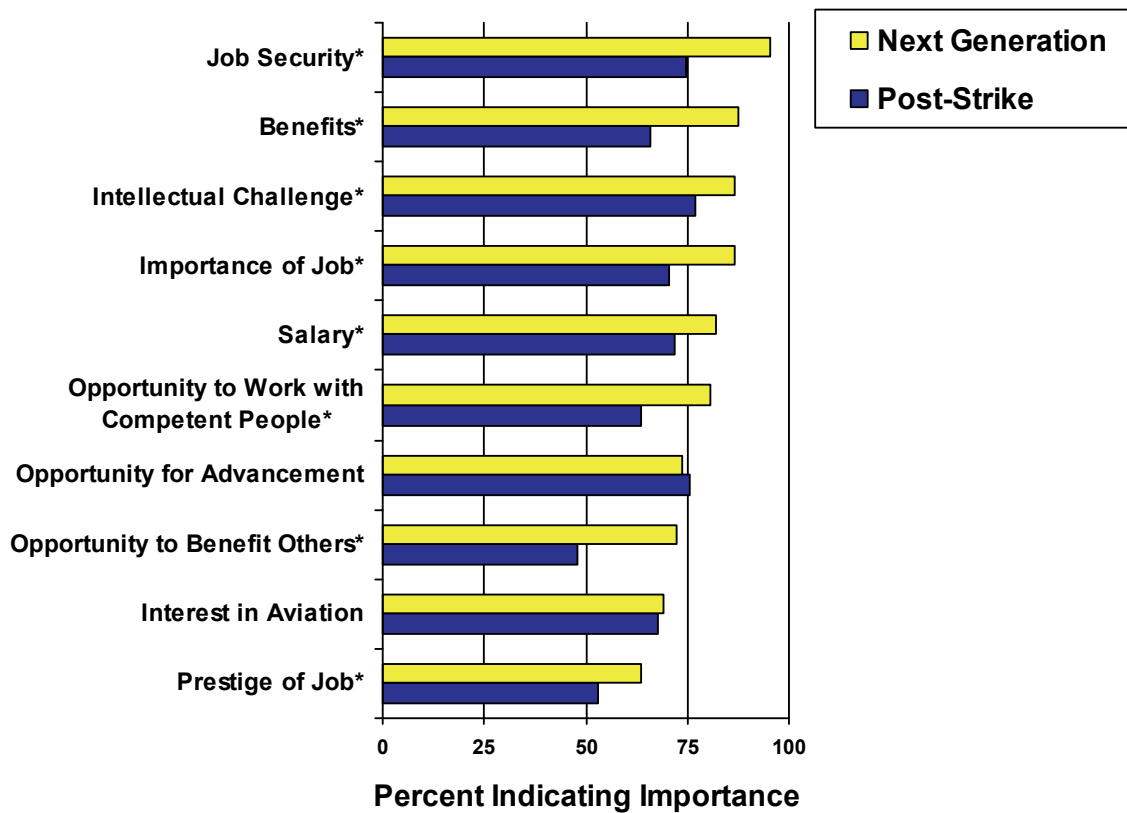
Table 2 shows the results of the Z-tests. These results are presented graphically in Figure 2, with items sorted in order of importance to Next Generation trainees. For most of the occupational choice factors measured, the proportion of the Next Generation cohort who endorsed the factor as having considerable or very great importance to their occupational choice was greater than the proportion of the Post-Strike generation. For example, a vast majority (almost 96%) of the Next Generation controllers marked "Job security" as having considerable or very great importance to their choice of the ATC occupation, compared to about 75% of the Post-Strike generation. Similarly, more Next Generation controllers (88%) rated "Benefits" as having considerable or very great importance than did Post-Strike controllers (66%). This

pattern was observed for 10 of the 14 factors influencing occupational choice. The proportion of controllers who endorsed factors as having considerable or very great importance was similar across the two groups of controllers for only four occupational choice factors: Opportunity for Advancement, Interest in Aviation, Autonomy, and Prior Aviation Experience.

The rank-ordering (sorted in descending order by the percent endorsing a factor as having considerable or very great importance to occupational choice) varied to some degree by cohort. For example, the "Benefits" item was second in importance to the Next Generation controllers, whereas it was seventh for the Post-Strike controllers (see Table 3). With the exception of Benefits and Opportunity for Advancement, the generational differences in occupational choice item importance appear to be more in *degree* than *order* of importance. The rank order of occupational choice factors was statistically similar across cohorts (See Figure 3; Spearman's  $\rho = .824$ ,  $p < .001$ ).

## DISCUSSION

The hypothesized diminished importance for job security, benefits, and salary for Next Generation ATCSs relative to Post-Strike ATCSs was not supported by these

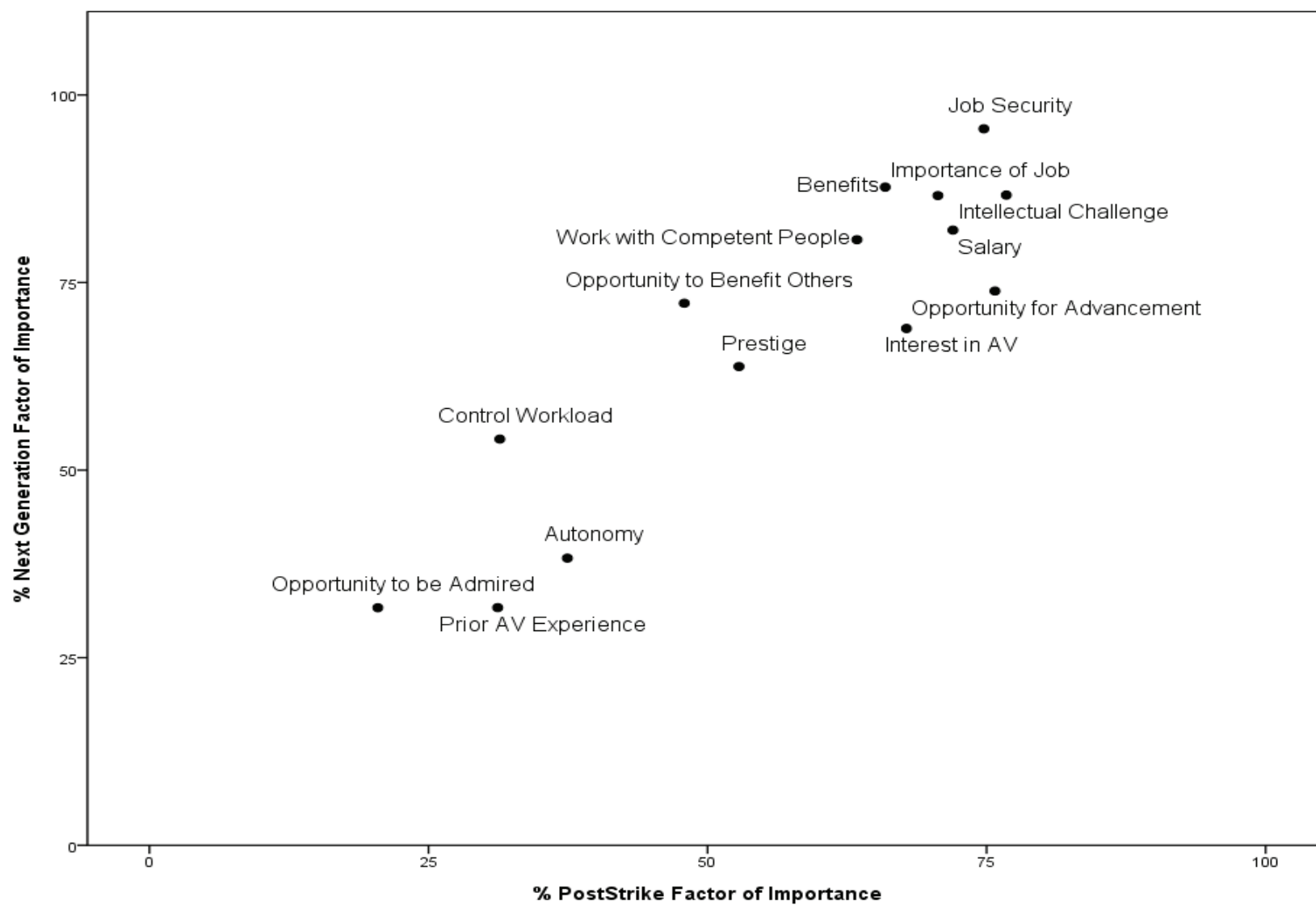


*\*Indicates Z-test of Independent Proportions significant at the  $p < .001$  level*

**Figure 2.** Top 10 Occupational Choice Concerns for ATCS Trainees

**Table 3.** Occupational Choice Variables Ranked by Importance to Generation

Factor	Post-Strike	Next Generation
Job Security	3	1
Benefits	7	2
Intellectual Challenge	1	3
Importance of Job	5	4
Salary	4	5
Opportunity to Work with Competent People	8	6
Opportunity for Advancement	2	7
Opportunity to Benefit Others	10	8
Interest in Aviation	6	9
Prestige of Job	9	10
Ability to Control Workload	12	11
Autonomy	11	12
Prior Aviation Experience	13	13
Opportunity to be Admired by Others	14	14



**Figure 3.** Importance of Factor to Occupational Choice

results. Instead, Next Generation ATCS trainees rated most occupational choice factors as more important than did Post-Strike controllers (at the time of entry into the occupation). One explanation for these differences might be generational effects: These factors are more important, in an absolute sense, to the Next Generation controllers than to the Post-Strike controllers. An alternative explanation might be a systematic, upwards bias in the responses of the Next Generation controllers.

The largest differences between the two groups were the relative importance of benefits and opportunity to advance, with benefits being of much higher importance than opportunity to advance for the Next Generation trainees, and vice versa for the Post-Strike trainees. The attention that benefits such as health insurance have received in the general media and political arena may explain this difference in the importance of benefits to the choice to become a controller. The high degree of importance of benefits to Next Generation ATCSs is consistent with another empirical study of newly hired, entry-level government workers (U.S. Merit Systems Protection Board [MSPB], 2008). In that study, the importance of several job factors in the consideration of job offers was analyzed by age group. Although the MSPB study found few statistical differences in the importance of most job factors (e.g., annual salary increases, portable retirement plan, structured training, flexible schedules), there was a significant difference across age groups for health insurance benefits. Ninety-six percent of newly-hired federal government workers under age 30 endorsed health insurance as important, versus only 79 percent of those 30 and over (MSPB, 2008). The results of the current study, along with those of the MSPB (2008), suggest that traditional job benefits such as health insurance are of considerable importance to young people contemplating employment with the federal government.

Apart from the increased importance of benefits to the Next Generation trainees, the Post-Strike and Next Generation trainees otherwise prioritized various occupational choice factors very similarly. This is important from a management perspective, as articles and stories in the popular media and HR trade press suggest that there are significant differences between different generations that must be addressed in order to attract and retain the next generation of workers. This appears not to be the case for newly hired ATCS trainees. This next generation of ATCS trainees is just as interested, if not more, in material factors such as job security and pay as were newly hired trainees in the Post-Strike era. This might be an effect of economic insecurity engendered by the U.S. 2007-2010 financial crisis.

A limitation of this study is that both samples of controllers were tested on arrival to training, after having been selected for the job. It is possible that our selection of KSAOs (Knowledge, Skills, Abilities, and Other Attributes) resulted in selection of similar values as well. Research looking at applicants prior to selection would have to be conducted to rule out the effects of selection on importance of occupational choice factors to controllers.

In the effort to attract younger workers to the government workplace, recruitment marketing has focused strongly on the public service aspect of government jobs. The results of this study show that while the opportunity to benefit others is important, other factors such as job security, benefits, and pay are more important to the Next Generation of controllers. It will be important in recruitment efforts to balance the emphasis on public service with that of more material factors such as benefits.



## REFERENCES

- Bureau of Labor Statistics (BLS; 2010). *Labor force statistics from the current population survey*. Retrieved September 10, 2010 from <http://data.bls.gov:8080/PDQ/outside.jsp?survey=ln>
- Broach, D. (Ed.) (1998). *Recovery of the FAA air traffic control specialist workforce, 1981-1992*. (Report No. DOT/FAA/AM-98/23). Washington, DC: Office of Aviation Medicine, Federal Aviation Administration.
- Federal Aviation Administration (FAA; 2010). *A plan for the future: 10-year strategy for the air traffic control workforce, 2010 – 2019*. Retrieved June 18, 2010 from [http://www.faa.gov/air\\_traffic/publications/controller\\_staffing/media/CWP\\_2010.pdf](http://www.faa.gov/air_traffic/publications/controller_staffing/media/CWP_2010.pdf)
- Federal Aviation Administration (Undated). *Generational issues in the workplace* (FAA30080018). Palm Coast, FL: FAA Center for Management Education and Leadership. Retrieved July 27, 2010 from [https://employees.faa.gov/org/staffoffices/ahr/learn\\_develop/media/CME.xls](https://employees.faa.gov/org/staffoffices/ahr/learn_develop/media/CME.xls)
- Gimbel, T. (2007). *Managing millennials*. New York, NY: American Management Association. Retrieved July 27, 2010 from <http://www.amanet.org/training/articles/printversion/Managing-Millennials.aspx>
- Kanji, G.K. (1999). *100 statistical tests*. Thousand Oaks, CA: Sage.
- Kimberly, J. (2008, May). Crossing the generational divide: Strategies for integrating younger workers into your business. *Business NH Magazine*, 25 (5), 34-35. Retrieved June 18, 2010 from <http://search.epnet.com>
- Kupperschmidt, B.R. (2000). Multigenerational employees: Strategies for effective management. *Health Care Manager*, 19, 65-76.
- Lancaster, L.C. & Stillman, D. (2002). *When generations collide: Who they are, why they clash, how to solve the generational puzzle at work*. New York: Harper Collins.
- Lyons, S., Duxbury, L., & Higgins, C. (2005). *An empirical assessment of generational differences in work-related values*. Presented at Administrative Sciences Association of Canada, May 28-31, 2005. Toronto, Canada.
- Mackey, K., Gardner, D. & Forsyth, S. (2008). Generational differences at work: Introduction and overview. *Journal of Managerial Psychology*, 23, 857-861.
- McGuigan, C.H. (2010). *Generation and career concern: Their impact on perceptions of employability and job insecurity in a changing employment context*. Unpublished Thesis, University of Canterbury. Retrieved May 27, 2010 from [http://ir.canterbury.ac.nz/bitstream/10092/3759/1/Thesis\\_fulltext.pdf](http://ir.canterbury.ac.nz/bitstream/10092/3759/1/Thesis_fulltext.pdf)
- National Transportation Safety Board (1981). *Air traffic control system*. (NTSB-SIR-81-7). Washington, DC: Author.
- Partnership for Public Service (Undated). The call to serve. Washington, DC: Author. Retrieved July 27, 2010 from <http://ourpublicservice.org/OPS/programs/calltoserve/>
- Partnership for Public Service (2009). Great expectations: What students want in an employer and how federal agencies can deliver it. Washington, DC: Author.
- Smola, K.W. & Sutton, C.D. (2002). Generational differences: Revisiting generational work values for the new millennium. *Journal of Organizational Behavior*, 23, 363-382.
- Strauss, W. & Howe, N. (1991). *Generations: The history of America's future, 1584 to 2069*. New York: William Morrow & Co.
- U.S. Merit Systems Protection Board (2008). *Attracting the next generation: A look at federal entry-level new hires*. A report to the President and Congress of the United States. Washington, DC: Author.
- Zemke, R., Raines, C., & Filipczack, B. (2000). *Generations at work: Managing the clash of veterans, Boomers, Xers, and Nesters in your workplace*. New York: AMACOM.

